EPA has developed a Radial Plume Mapping (RPM) technique using a novel but simple configuration of nonoverlapping radial beam path-integrated concentration data collected with a single instrument and optimization algorithms to map concentration distributions in a plane. Applied downwind from an area emission source the combination of wind information and vertical concentration profiles of the plume allows calculation of emission rates for the area source.
Commercial-off-the-shelf Optical Remote Sensors such as Fourier Transform Infrared (FTIR) can be utilized to provide path-integrated concentration data. The technique has application to a wide range of sources, e.g., site remediation projects involving volatile solvents, industrial waste treatment facilities, animal feed lots, military and civilian applications to the detection of toxic industrial chemicals and chemical weapon agents, etc. The RPM technique can be applied in either vertical or horizontal planes. Spatially distributed concentration maps developed from data collected from horizontal scans show “hot spots” of emissions over an area source such as a landfill or development (e.g., athletic fields) installed over a closed landfill or contaminated site.
See Measurement of Fugitive Emissions at a Region I Landfill (EPA 600-R-04-001) or download at http://clu-in.org/programs/21m2/projects/epa600r04001.pdf or http://clu-in.org/techpubs.htm.